AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Original) A force-resisting device for transmitting forces and dissipating and absorbing energy across a discontinuous structural element of a structure, the device comprising:

at least one active element, the active element having defined force versus deflection properties, wherein the active element is configured to provide a load path across a discontinuous structural element.

2. (Original) The force-resisting device according to Claim 1, wherein the active element is configured to be connected to a structure including the discontinuous structural element.

3. (Currently Amended) The force-resisting device according to Claim 1, wherein said force load versus deflection property behaves initially elastic and then changes to plastic under higher applied loads.

4. (Currently Amended) The force-resisting device according to Claim 1, wherein said force load versus deflection property behaves initially elastic, then

changes to plastic under higher applied loads, then changes back to elastic under highest applied loads to limit deflection.

5. (Currently Amended) The force-resisting device according to Claim 1, wherein said force load versus deflection property behaves initially elastic, then becomes progressively more resistant to load via plasticity under higher applied loads, thereby dissipating more energy as forces applied to said active element increase.

6. (Currently Amended) The force-resisting device according to Claim 1, wherein said force load versus deflection property behaves initially elastic, then becomes progressively more resistant to load via combined elasticity and plasticity under higher applied loads, thereby dissipating more energy as forces applied to said active element increase.

7. (Original) The force-resisting device of Claim 1, wherein the force-resisting device is a building connector spanning a joint, the connector configured to transmit force and dissipate and absorb energy via defined force versus deflection properties.

8. (Original) A force-resisting device for transmitting forces and dissipating and absorbing energy across a discontinuous structural element of a structure, the device comprising:

at least one active element having at least a first end and a second end, the active element having defined force versus deflection properties and configured to transmit force and dissipate and absorb energy, wherein the first end of the active element is configured to be connected to a structure; and

at least one frame element disposed about a discontinuous structural element, wherein the frame element is configured to be connected to the second end of the active element, the active element and the frame element are configured to resist forces and reduce stresses and replace stiffness, dissipation, and strength to the structure.

9. (Original) The force-resisting device according to Claim 8, wherein said frame element comprises at least one active element.

10. (Original) The force-resisting device according to Claim 8, wherein said discontinuous structural element is an opening and the frame elements are configured to encircle the opening.

11. (Original) A force-resisting device for transmitting forces and dissipating and absorbing energy across a discontinuous structural element of a structure, the device comprising:

at least one active element having at least a first end and a second end, the active element having defined force versus deflection properties and configured to transmit force and dissipate and absorb energy, wherein the first end of the active element is configured to be connected to a structure; and

at least one frame element configured to be connected to a discontinuous structural element, said frame element configured to be connected to the second end of the active element, wherein the active element and the frame element are configured to resist forces applied to the structure by transmitting forces across the discontinuous structural element.

12. (Original) The force-resisting device according to Claim 11, wherein said structure consists of a shear wall.

13. (Original) The force-resisting device according to Claim 11, wherein said discontinuous structural element consists of an opening.

14. (Original) The force-resisting device according to Claim 11, wherein said frame element comprises at least one active element.

15. (Previously Amended) The force-resisting device according to Claim 11, wherein one active element is configured to be attached to a structural sill plate.

16. (Original) A force-resisting device for transmitting forces and dissipating and absorbing energy across a discontinuous structural element of a structure, the device comprising:

at least one active element having at least a first end and a second end, the active element having defined force versus deflection properties and

configured to transmit force and dissipate and absorb energy, the first end of the active element configured to be connected to a structure;

at least one reinforcement element, the reinforcement element configured to be connected to a structure; and

at least one frame element configured to be disposed about a discontinuous structural element, wherein the frame element is configured to be connected to the second end of the active element, wherein the active element, the frame element, and the reinforcement element are configured to resist forces applied to the structure by transmitting forces across the discontinuous structural element and are further configured to reduce stresses and replace stiffness, dissipation, and strength to the structure.

17. (Original) The force-resisting device according to Claim 16, wherein the structure is a shear wall.

18. (Original) The force-resisting device according to Claim 16, wherein the discontinuous structural element is an opening.

Claims 19 to 21 (Canceled)

22. (New) A force resisting device for transmitting forces and dissipating and absorbing energy, the device comprising:

at least one active element, the active element having a non-planar region and having a force versus deflection property under at least one cyclic load,

wherein the force versus deflection property has three regions during a positive portion of the cyclic load and three regions during a negative portion of the cyclic load

wherein the three regions during the positive portion include two elastic regions and one plastic region and the three regions during the negative portion include two elastic regions and one plastic portion.

23. (New) The force resisting device of claim 22, wherein the positive portion of the cyclic load is from a neutral force to a maximum positive force.

24. (New) The force resisting device of claim 23, wherein the three regions during the positive portion include, in order with increasing force, a first elastic region, a first plastic region and a second elastic region.

25. (New) The force resisting device of claim 22, wherein the negative portion of the cyclic load is from a maximum positive force to a neutral force.

26. (New) The force resisting device of claim 25, wherein the three regions during the negative portion include, in order with decreasing force, a first elastic region, a first plastic region and a second elastic region.

27. (New) The force resisting device of claim 22, wherein the positive portion of the cyclic load is from a neutral force to a maximum positive force and the negative portion of the cyclic load is from the maximum positive force to the neutral force.

28. (New) The force resisting device of claim 27, wherein the three regions during the positive portion include, in order with increasing force, a first elastic region, a first plastic region and a second elastic region and wherein the three regions during the negative portion include the three regions of the positive portion, in opposite order with decreasing force.

29. (New) The force resisting device of claim 28, wherein the opposite order of the three regions includes, in order with decreasing force, the second plastic region, the first plastic region and the first elastic region.

30. (New) The force resisting device of claim 22, wherein the non-planar region has a v-shape when viewed from a side of the force resisting device.

31. (New) The force resisting device of claim 22, wherein the v-shape is non-symmetric about a bisector of an apex of the v-shape.

32. (New) The force resisting device of claim 22, wherein the force is a shear force.

33. (New) A structure incorporating the device of claim 22, wherein the device joins two structural elements with a first portion of the device fixed to a first of the two structural elements and a second portion of the device fixed to a second of the two structural elements, and wherein the first portion and the second portion are co-planar and the non-planar region is between the first portion and the second portion along the first dimension.

34. (New) The structure of claim 33, wherein the non-planar region has a v-shape when viewed in cross-section from a direction perpendicular to the first dimension.

35. (New) The structure of claim 34, wherein the v-shape is non-symmetric about a bisector of an apex of the v-shape.

36. (New) The structure of claim 33, wherein the two structural elements are two studs in a building panel.

37. (New) The structure of claim 33, wherein the two structural elements are a stud and a framing element for an opening in a building panel.

38. (New) The structure of claim 33, wherein the two structural elements are a framing element for an opening in a building panel and a sheathing or shear membrane.

39. (New) The structure of claim 38, wherein the sheathing or shear membrane is plywood or oriented strand board.

40. (New) The structure of claim 38, comprising means for attaching the building panel to an adjacent structure.

41. (New) The structure of claim 40, wherein the adjacent structure is a foundation.

42. (New) The structure of claim 40, wherein means for attaching transmits forces to the adjacent structure.

43. (New) A shear resistant building structure comprising:

a first structural element;

a second structural element; and

at least one active element, the active element having a non-planar region and having a force versus deflection property under at least one cyclic load,

wherein the at least one active element joins the two structural elements with a first portion of the active element fixed to a first of the two structural elements and a second portion of the active element fixed to a second of the two structural elements,

wherein the first portion and the second portion are co-planar and the non-planar region is between the first portion and the second portion along a first dimension,

wherein the force versus deflection property has three regions during a positive portion of the cyclic load and three regions during a negative portion of the cyclic load, and

wherein the three regions during the positive portion include two elastic regions and one plastic region and the three regions during the negative portion include two elastic regions and one plastic portion.

44. (New) The shear resistant building structure of claim 43, wherein the non-planar region has a v-shape when viewed in cross-section from a direction perpendicular to the first dimension.

45. (New) The shear resistant building structure of claim 44, wherein the v-shape is non-symmetric about a bisector of an apex of the v-shape.

46. (New) The shear resistant building structure of claim 43, wherein the first structural element is a first stud of a wood or metal framed wall portion and the second structural element is a second stud of a wood or metal framed wall portion.

47. (New) The shear resistant building structure of claim 43, wherein the two structural elements are a stud of a wood or metal framed wall portion and an opening in a building panel.

48. (New) The shear resistant building structure of claim 47, wherein the opening is sized for a window or a door.

49. (New) The shear resistant building structure of claim 43, wherein the two structural elements are a framing element for an opening in a building panel and a sheathing or shear membrane.

50. (New) The shear resistant building structure of claim 49, wherein the sheathing or shear membrane is plywood or oriented strand board.

51. (New) The shear resistant building structure of claim 43, wherein the positive portion of the cyclic load is from a neutral force to a maximum positive force.

52. (New) The shear resistant building structure of claim 51, wherein the three regions during the positive portion include, in order with increasing force, a first elastic region, a first plastic region and a second elastic region.

53. (New) The shear resistant building structure of claim 43, wherein the negative portion of the cyclic load is from a maximum positive force to a neutral force.

54. (New) The shear resistant building structure of claim 53, wherein the three regions during the negative portion include, in order with decreasing force, a first elastic region, a first plastic region and a second elastic region.

55. (New) The shear resistant building structure of claim 43, wherein the positive portion of the cyclic load is from a neutral force to a maximum positive force and the negative portion of the cyclic load is from the maximum positive force to the neutral force.

56. (New) The shear resistant building structure of claim 55, wherein the three regions during the positive portion include, in order with increasing force, a first elastic region, a first plastic region and a second elastic region and wherein the three regions during the negative portion include the three regions of the positive portion, in opposite order with decreasing force.

57. (New) The shear resistant building structure of claim 56, wherein the opposite order of the three regions includes, in order with decreasing force, the second plastic region, the first plastic region and the first elastic region.

58. (New) The shear resistant building structure of claim 43, wherein the non-planar region has a v-shape when viewed from a side of the force resisting device.

59. (New) The shear resistant building structure of claim 58, wherein the v-shape is non-symmetric about a bisector of an apex of the v-shape.

60. (New) The shear resistant building structure of claim 43, wherein the force is a shear force.

61. (New) The shear resistant building structure of claim 43, comprising means for attaching at least one of the first structural element and the second structural element to an adjacent structure.

62. The shear resistant building structure of claim 43, wherein the adjacent structure is a foundation.

63. (New) A building including the shear resistant building structure of any one of claims 43 to 62.

64. (New) A shear membrane for absorbing forces and dissipating energy in a shear structure under a shear force applied to the shear membrane in a plane of the shear membrane, the shear membrane comprising:

two non-contacting structural elements; and

an elastoplastically-deforming element with a non-planar portion , the non-planar portion absorbing a portion of the shear force applied to the shear membrane and absorbing a portion of the energy of the shear force by elastoplastic deformation of the elastoplastically-deforming element under the shear force,

wherein the elastoplastically-deforming element connects the two non-contacting structural elements with the non-planar portion located between the two non-contacting structural elements.

65. (New) The shear membrane of claim 64, wherein the elastoplastically-deforming element exhibits reversible behavior under one or more shear force cycles.

66. (New) The shear membrane of claim 65, wherein the one or more shear force cycles is at least 2 cycles.

67. (New) The shear membrane of claim 66, wherein the one or more shear force cycles is at least 3 cycles.

68. (New) The shear membrane of claim 65, wherein a positive portion of the shear force cycle is from a neutral force to a maximum positive force and a negative portion of the cyclic load is from the maximum positive force to the neutral force.

69. (New) The shear membrane of claim 68, wherein regions of elastoplastic deformation during the positive portion include, in order with increasing force, a first elastic region, a first plastic region and a second elastic region and wherein the regions or elastoplastic deformation during the negative portion include

the regions of the positive portion, in order with decreasing force, the second elastic region, the first plastic region and the first elastic region.

70. (New) The shear membrane of claim 64, comprising an opening in the shear membrane framed by a plurality of framing elements, wherein one of the two non-contacting structural elements is one of the plurality of framing elements, wherein a shear force as a function of deflection curve is substantially the same for the shear membrane with the opening and for the shear membrane without the opening.

71. (New) The shear membrane of claim 70, wherein the opening is sized for a window or a door.

72. (New) The shear membrane of claim 64, wherein the non-planar portion has a substantially v-shaped cross-section.

73. (New) The shear membrane of claim 72, wherein the substantially v-shaped cross-section is a v-shape with a non-symmetric bisector of an apex of the v-shape.

74. (New) The shear membrane of claim 64, wherein the shear membrane is a portion of a building panel, a portion of a building wall, or a portion of a roof panel.

75. (New) The shear membrane of claim 64, wherein the elastoplastically-deforming element transmits, absorbs and dissipates all resultant forces in the shear membrane from the applied shear force.

76. (New) The shear membrane of claim 64, comprising means for attaching at least one of the two non-contacting structural elements to an adjacent structure.

77. (New) The shear membrane of claim 76, wherein the adjacent structure is a foundation.

78. (New) A force resisting device for transmitting forces and dissipating and absorbing energy, the device comprising:

at least one active element, the active element having two in-plane regions and one out-of-plane region,

wherein the active element has a force versus deflection property over building code required loads of only elastic behavior and plastic behavior.

79. (New) The force resisting device of claim 78, wherein the out-of-plane region has a v-shape when viewed from a side of the force resisting device.

80. (New) The force resisting device of claim 79, wherein the v-shape is non-symmetric about a bisector of an apex of the v-shape.

81. (New) The force resisting device of claim 78, wherein the force is a shear force.

82. (New) The force resisting device of claim 78, wherein the code required loads include seismic loads.

83. (New) The force resisting device of claim 78, wherein the code required loads include wind loads

84. (New) A structure incorporating the device of claim 78, wherein the active element joins two structural elements with a first of the two in-plane regions fixed to a first of the two structural elements and a second of the two in-plane regions of the active element fixed to a second of the two structural elements

85. (New) The structure of claim 84, wherein the first of the two in-plane regions and the second of the two in-plane regions are co-planar and the out-of-plane region is between the first region and the second.

86. (New) The structure of claim 84, wherein the two structural elements are a framing element for an opening in a building panel and a sheathing or shear membrane.

87. (New) The structure of claim 86, wherein the sheathing or shear membrane is plywood or oriented strand board.

88. (New) The structure of claim 84, comprising means for attaching at least one of the two structural elements to an adjacent structure.

89. (New) The structure of claim 88, wherein the adjacent structure is a foundation.

90. (New) A force resisting device for transmitting forces and dissipating and absorbing energy, the device comprising:

at least one active element, the active element having two in-plane regions and one out-of-plane region,

wherein the active element is only elastoplastic over a deflection distance mandated by an uniform building code.

91. (New) The force resisting device of claim 90, wherein the deflection distance is two inches.

92. (New) The force resisting device of claim 90, wherein the out-of-plane region has a v-shape when viewed from a side of the force resisting device.

93. (New) The force resisting device of claim 90, wherein the v-shape is non-symmetric about a bisector of an apex of the v-shape.

94. (New) The force resisting device of claim 90, wherein the force is a shear force.

95. (New) A structure incorporating the device of claim 90, wherein the active element joins two structural elements with a first of the two in-plane regions fixed to a first of the two structural elements and a second of the two in-plane regions of the active element fixed to a second of the two structural elements.

96. (New) The structure of claim 95, wherein the first of the two in-plane regions and the second of the two in-plane regions are co-planar and the out-of-plane region is between the first region and the second.

97. (New) The structure of claim 95, wherein the two structural elements are a framing element for an opening in a building panel and a sheathing or shear membrane.

98. (New) The structure of claim 97, wherein the sheathing or shear membrane is plywood or oriented strand board

99. (New) The structure of claim 95, comprising means for attaching at least one of the two structural elements to an adjacent structure.

100. (New) The structure of claim 99, wherein the adjacent structure is a foundation.

101. (New) A shear panel, comprising:

a panel joined to a frame;

an opening formed through an interior portion of the panel from a first side to a second side; and

at least one active element for transmitting forces and dissipating and absorbing energy,

wherein the shear panel deflects 2 inches in a shear direction under a force of no less than 9000 pounds.

102. (New) The shear panel of claim 101, wherein the force is no less than approximately 9800 pounds.

103. (New) The shear panel of claim 102, wherein the force is from approximately 9800 pounds to approximately 10,700 pounds.

104. (New) The shear panel of claim 103, wherein the force is approximately 10,700 pounds.

105. (New) The shear panel of claim 101, wherein the panel is one or more of plywood or oriented strand board.

106. (New) The shear panel of claim 101, wherein the frame is a wood frame formed of structural lumber.

107. (New) The shear panel of claim 106, wherein structural lumber includes 2"x4" or 2"x6".

108. (New) The shear panel of claim 101, wherein the panel is joined by nails to the frame.

109. (New) The shear panel of claim 101, wherein the opening is capable of accommodating a window.

110. (New) A building including the shear panel of claim 101.

111. (New) The building of claim 110, comprising means for attaching the shear panel to an adjacent shear panel or to a foundation.

112. (New) A shear panel, comprising:

a panel of plywood or oriented strand board joined by nails to a frame of structural lumber;

an opening capable of accommodating a window, the opening formed through an interior portion of the panel from a first side to a second side; and

at least one active element for transmitting forces and dissipating and absorbing energy,

wherein the shear panel deflects no more than 2 inches in a shear direction under a force of from approximately 9800 pounds to approximately 10,700.

113. (New) A building including the shear panel of claim 112.

114. (New) The building of claim 113, comprising means for attaching the shear panel to an adjacent shear panel or to a foundation.

115. (New) A prefabricated shear membrane for absorbing forces and dissipating energy in a shear structure under a shear force applied to the prefabricated shear membrane in a plane of the prefabricated shear membrane, the prefabricated shear membrane comprising:

two non-contacting structural elements; and

an elastoplastically-deforming element with a non-planar portion , the non-planar portion absorbing a portion of the shear force applied to the shear membrane and absorbing a portion of the energy of the shear force by elastoplastic deformation of the elastoplastically-deforming element under the shear force,

wherein the elastoplastically-deforming element connects the two non-contacting structural elements with the non-planar portion located between the two non-contacting structural elements.

116. (New) The prefabricated shear membrane of claim 115, wherein the elastoplastically-deforming element exhibits reversible behavior under one or more shear force cycles.

117. (New) The prefabricated shear membrane of claim 116, wherein the one or more shear force cycles is at least 2 cycles.

118. (New) The prefabricated shear membrane of claim 117, wherein the one or more shear force cycles is at least 3 cycles.

119. (New) The prefabricated shear membrane of claim 116, wherein a positive portion of the shear force cycle is from a neutral force to a maximum positive force and a negative portion of the cyclic load is from the maximum positive force to the neutral force.

120. (New) The prefabricated shear membrane of claim 119, wherein regions of elastoplastic deformation during the positive portion include, in order with increasing force, a first elastic region, a first plastic region and a second elastic region and wherein the regions or elastoplastic deformation during the negative portion include the regions of the positive portion, in order with decreasing force, the second elastic region, the first plastic region and the first elastic region.

121. (New) The prefabricated shear membrane of claim 120, comprising an opening in the shear membrane framed by a plurality of framing elements, wherein one of the two non-contacting structural elements is one of the plurality of framing elements, wherein a shear force as a function of deflection curve is substantially the same for the prefabricated shear membrane with the opening and for the prefabricated shear membrane without the opening.

122. (New) The prefabricated shear membrane of claim 120, wherein the opening is sized for a window or a door.

123. (New) The prefabricated shear membrane of claim 115, wherein the non-planar portion has a substantially v-shaped cross-section.

124. (New) The prefabricated shear membrane of claim 115, wherein the prefabricated shear membrane is a portion of a building panel, a portion of a building wall, or a portion of a roof panel.

125. (New) A building comprising the prefabricated shear panel of claim 115 and means for attaching the prefabricated shear panel to an adjacent shear panel or to a foundation.

126. (New) A prefabricated shear panel, comprising:

a panel joined to a frame;

an opening formed through an interior portion of the panel from a first side to a second side; and

at least one active element for transmitting forces and dissipating and absorbing energy,

wherein the shear panel deflects 2 inches in a shear direction under a force of no less than 9000 pounds.

127. (New) The prefabricated shear panel of claim 126, wherein the force is no less than approximately 9800 pounds.

128. (New) The prefabricated shear panel of claim 127, wherein the force is from approximately 9800 pounds to approximately 10,700.

129. (New) The prefabricated shear panel of claim 127, wherein the force is approximately 10,700.

130. (New) The prefabricated shear panel of claim 126, wherein the panel is one or more of plywood or oriented strand board.

131. (New) The prefabricated shear panel of claim 126, wherein the frame is a wood frame formed of structural lumber.

132. (New) The prefabricated shear panel of claim 126, wherein the panel is joined by nails to the frame.

133. (New) The prefabricated shear panel of claim 126, wherein the opening is capable of accommodating a window.

134. (New) A building including the prefabricated shear panel of claim 126.

135. (New) The building of claim 134, comprising means for attaching the prefabricated shear panel to an adjacent shear panel or to a foundation.